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☐ 1: Protein Expr Purif 1996 Nov;8(3):271-82

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ELSEVIER SCIENCE
FULL-TEXT ARTICLE

Eukaryotic expression systems: a comparison.

Geisse S, Gram H, Kleuser B, Kocher HP.

Sandoz Pharma Ltd., Basel, Switzerland.

Eukaryotic expression systems are frequently employed for the production of recombinant proteins as therapeutics as well as research tools. Most commonly used expression systems are based on stably transfected adherent CHO cells or nonadherent lymphoid cell lines. An efficient alternative is the infection of insect cells by recombinant baculoviruses. Transient expression in mammalian cells, e.g., COS cells, is often used for the production of smaller quantities of proteins. The choice of a suitable expression system depends largely on the biochemical and biological properties of the protein of interest, as well as on the nature of the planned experiments and the amount of recombinant protein required. We summarize here the expression of the cytokine human Leukemia Inhibitory Factor (hu-LIF) in five of the most commonly used systems, namely in CHO, Sp2/0, MEL, COS, and insect cells, in conjunction with an outline of the principles and characteristics of each of these expression systems. In result, the stably transfected cell lines, CHO, Sp2/0, and MEL cells, gave rise to production of fully glycosylated hu-LIF at variable product titers; incompletely glycosylated, albeit biological action hu-LIF could be rapidly produced by transient expression in COS cells or by baculovirus-mediated infection of insect cells.

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PMID: 8936588 [PubMed - indexed for MEDLINE]

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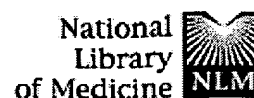


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LIGHT, a new member of the TNF superfamily, and lymphotoxin alpha are ligands for herpesvirus entry mediator.

Mauri DN, Ebner R, Montgomery RI, Kochel KD, Cheung TC, Yu GL, Ruben S, Murphy M, Eisenberg RJ, Cohen GH, Spear PG, Ware CF.

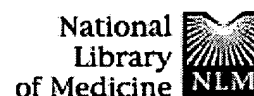
Division of Molecular Immunology, La Jolla Institute for Allergy and Immunology, San Diego, California 92121, USA.

Herpes simplex virus (HSV) 1 and 2 infect activated T lymphocytes by attachment of the HSV envelope glycoprotein D (gD) to the cellular herpesvirus entry mediator (HVEM), an orphan member of the tumor necrosis factor receptor superfamily. Here, we demonstrate that HVEM binds two cellular ligands, secreted lymphotoxin alpha (LTalpha) and LIGHT, a new member of the TNF superfamily. LIGHT is a 29 kDa type II transmembrane protein produced by activated T cells that also engages the receptor for the LTalpha-beta heterotrimer but does not form complexes with either LTalpha or LTbeta. HSV1 gD inhibits the interaction of HVEM with LIGHT, and LIGHT and gD interfere with HVEM-dependent cell entry by HSV1. This characterizes herpesvirus gD as a membrane-bound viokine and establishes LIGHT-HVEM as integral components of the lymphotoxin cytokine-receptor system.

PMID: 9462508 [PubMed - indexed for MEDLINE]

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☐ 1: Science 1994 Apr 29;264
(5159):707-10

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- Science. 1994 Apr 29;264(5159):667-9

A lymphotoxin-beta-specific receptor.

Crowe PD, VanArsdale TL, Walter BN, Ware CF, Hession C, Ehrenfels B, Browning JL, Din WS, Goodwin RG, Smith CA.

Division of Biomedical Sciences, University of California, Riverside 92521.

Tumor necrosis factor (TNF) and lymphotoxin-alpha (LT-alpha) are members of a family of secreted and cell surface cytokines that participate in the regulation of immune and inflammatory responses. The cell surface form of LT-alpha is assembled during biosynthesis as a heteromeric complex with lymphotoxin-beta (LT-beta), a type II transmembrane protein that is another member of the TNF ligand family. Secreted LT-alpha is a homotrimer that binds to distinct TNF receptors of 60 and 80 kilodaltons; however, these receptors do not recognize the major cell surface LT-alpha-LT-beta complex. A receptor specific for human LT-beta was identified, which suggests that cell surface LT may have functions that are distinct from those of secreted LT-alpha.

PMID: 8171323 [PubMed - indexed for MEDLINE]

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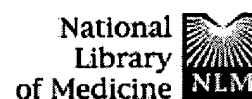
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☐ 1: Bioprocess Technol 1990;10:71-92

Related Articles, Books, LinkOut

Large-scale animal cell culture: a biological perspective.

Oka MS, Rupp RG.

SmithKline Beecham Pharmaceuticals, King of Prussia, Pennsylvania.

It is generally recognized that no one cell culture system can be universally applied to all cell types commonly used for biopharmaceutical manufacture. The analogous concept that no single cell type may be useful for the expression of all biopharmaceutical products may also gain credence in the biotechnology community. It may be that like specialized bioreactors, there will come to exist a variety of cell types that will be used for the production of different types of biopharmaceutical products. In addition, it may not be enough in the future just to demonstrate the stability of expression of the amino acid backbone of the protein only; the carbohydrate portion of the molecule may become the subject of real scrutiny. Questions such as how the carbohydrate side chain affects the performance of the molecule in vivo are being asked of more DNA constructs. The next question becomes, how can we control the expression of carbohydrate moieties on the molecule? Such questions are in the future of the biotech manufacturing field. Aside from those examples mentioned above dealing with the insertion of receptors, other more subtle attempts at modifying cellular metabolism are taking place. It was reported at a recent meeting that the sialyltransferase gene was inserted into a CHO line which did not normally express this enzyme (116). The transfected line was capable of expressing the transferase and, more importantly, the enzyme functioned correctly in sialylating glycoproteins. Other very complex relationships exist between the substratum and the cell that could have very direct consequences on culture maintenance. For example, researchers recently published results indicating that collagenase synthesis and secretion is stimulated in rabbit fibroblasts by autocrine factors. They determined that these autocrine proteins had sequence homology to serum amyloid-A and beta-2-microglobulin. It may be that using serum supplements in the medium in those systems that couple fibroblast and collagen substratum may not be prudent, especially for long-term culture. The traditional selection of a cell type for expressing heterologous proteins has generally been limited to the more "common" cell types such as CHO cells, C127 cells, and myeloma cells. In many cases these cell types were selected because there was a great deal of preexisting

literature on the cell type (i.e., "cookbook" methods of transfection for the cell) or the cell was simply being carried in the lab at the time the effort was made to express a biopharmaceutical product.(ABSTRACT TRUNCATED AT 400 WORDS)

Publication Types:

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PMID: 1367073 [PubMed - indexed for MEDLINE]

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